CLAIMS

What is claimed is:

1. A method of performing a runway survey on a rail system, the rail system utilized to support a device such as an overhead crane, the method comprising:

mounting a self-leveling laser on the rail system, the self-leveling laser including a level sensor positioned to determine a level condition of the laser, the level sensor generating a signal representative of the level condition of the laser;

adjusting a level position of the laser using the signal generated by the level sensor;

supporting a survey car on the rail system for movement relative to the laser, the survey car including an image acquisition device;

projecting a laser spot on the image acquisition device by emitting a laser beam from the laser when the laser is substantially level; and

capturing an image of the laser spot using the image acquisition device.

2. A method according to claim 1 wherein the image acquisition device includes a screen and an image capturing device positioned to obtain an image of the screen, wherein projecting a laser spot on the image acquisition device includes projecting a laser spot on the screen, and wherein capturing an image of the laser spot includes capturing an image of the screen.

3. A method according to claim 2 and further comprising filtering the light entering the image capturing device using a bandpass filter.

4. A method according to claim 1 and further comprising determining a centroid of the image of the laser spot.

5. A method according to claim 1 wherein mounting a self-leveling laser on the rail system includes mounting a housing on the rail system, wherein the housing supports a bracket which pivotally supports the laser relative to the housing, and wherein adjusting a level position of the laser includes controlling a motor to pivot the laser relative to the bracket.

6. A method according to claim 1 wherein supporting a survey car on the rail system includes supporting a self-propelled survey car on the rail system, wherein the self-propelled survey car includes a drive mechanism to move the survey car relative to the rail system.

7. A method according to claim 1 wherein supporting a survey car on the rail system includes centering the survey car on a rail of the rail system using first and second biasing assemblies respectively positioned on each side of the rail.

8. A method according to claim 1 and further comprising controlling movement of the survey car on the rail system relative to the laser from a remote position.

9. A method according to claim 1 and further comprising transmitting data representative of the captured image to a computer located remotely from the survey car.

10. A laser survey device for performing a runway survey on a rail system, the rail system utilized to support a device such as an overhead crane, the laser survey device comprising:

a laser mounted on a rail of the rail system; and

a self-propelled survey car supported on the rail for movement relative to the laser, the self-propelled survey car including a drive mechanism to move the survey car along the rail relative to the laser, the survey car including an image acquisition device, the laser emitting a laser beam that projects a laser spot on the image acquisition device, the image acquisition device capturing an image of the laser spot.

11. A laser survey device according to claim 10 wherein the drive mechanism includes at least one drive wheel supported on the rail of the rail system.

12. A laser survey device according to claim 10 wherein the image acquisition device includes a screen and an image capturing device positioned to obtain an image of the screen, and wherein the image capturing device captures an image of the screen that includes an image of the laser spot.

13. A laser survey device according to claim 10 wherein the self-propelled survey car also includes an encoder connected to a shaft, wherein movement of the shaft is representative of movement of the survey car relative to the rail, and wherein the encoder triggers acquisition of the image of the laser screen.

14. A laser survey device according to claim 10 wherein the rail includes a top portion, a bottom portion, and first and second side portions extending between the top and bottom portions, wherein the survey car includes a first biasing assembly contacting the first side portion and a second biasing assembly contacting the second side portion to center the survey car on the rail.

15. A laser survey device according to claim 10 wherein the first and second biasing assemblies each include a guide roller biased toward the corresponding side portion of the rail by a spring.

16. A laser survey device according to claim 10 wherein the survey car is a top-running survey car.

17. A laser survey device according to claim 10 wherein the survey car is a bottom-running survey car.

18 A method of performing a runway survey on a rail system, the rail system utilized to support a device such as an overhead crane, the method comprising:

mounting a laser on the rail system;

supporting a survey car on the rail system for movement relative to the laser, the survey car including a screen and an image capturing device positioned to obtain an image of the screen;

emitting a laser beam from the laser, the laser being projecting a laser spot on the screen;

capturing an image of the screen using the image capturing device, the image of the screen including an image of the laser spot; and

determining a centroid of the image of the screen, the centroid including an X dimension and a Y dimension.

19. A method according to claim 18 and further comprising transmitting data representing the image of the screen to a computer located remotely from the survey car.

20. A method according to claim 18 and further comprising triggering acquisition of the image of the screen based upon movement of the survey car on the rail system.